Specification for seeding and mulching highway right of way

The scope of this project is to seed and mulch per the 2007 KDOT Standard Specifications at a highway right of way site. The job site is located at approximately I-435 and Johnson Drive, Shawnee, Kansas in Johnson County, Kansas.

The site is approximately 1.5 acres and is located at the west side of the off ramp of South Bound I-435.

Work shall be performed and completed by JUNE 30, 2013.

The proposal shall include all site preparation, seeding, fertilizer, and installation of Class I Erosion Control Blanket for the entire acreage.

The seeding mix shall be the following and placed according to the attached Special Provision 07-09004 and Specification Section 903 Seeding:

PLS Rate: lbs./ac.	1.5 acre total lbs	Bid Item
0.3	0.45	Blue Grama Grass Seed (Lovington)
11	16.5	Buffalograss Seed (Treated)
0.16	0.24	Prairie Junegrass
3.8	5.7	Canada Wildrye Grass Seed
2.3	3.45	Side Oats Grama Grass Seed (El Reno)
10	15	Regreen
4	6	Western Wheatgrass Seed (Barton)

The fertilizer shall adhere to KDOT Specification Section 2108 Fertilizers.

The Class I, Erosion Control Blanket shall adhere to KDOT Specification Section 901 Temporary Erosion & Pollution Contol Section 901, the attached KDOT Standard Drawings for installation of Erosion Control Blankets, and be a product from the PQL, Prequalified List of Products for Clay Soils.

Local contact information:

Brian Bosak, Construction Engineer, office 913-764-4525, cell 913-314-4004

Or Drake Jennings, Area Superintendent, office 913-764-0987, cell 816-835-7383

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KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, 2007 EDITION

SECTION 903

SEEDING

Page 900-8, subsection 903.2. Replace "Bureau of Design", with "Bureau of Right of Way".

Page 900-8, subsection 903.3b. Add the following to the end of the first paragraph:
Seed and mulch the area within 24 hours of seedbed preparation.

03-27-13 RW(ES)
Jul-13 Letting

SECTION 903

SEEDING

903.1 DESCRIPTION

Prepare the seedbed, provide the seed and plant at the rate and in the locations designated in the Contract Documents.

BID ITEMS	UNITS
Seed (*)	Pound
Seed (Hydro) (*)	Pound
Seeding	Lump Sum

* Type of Seed

903.2 MATERIALS

Provide seeds and nitrogen-fixing bacteria that comply with **DIVISION 2100.** Do not change seed or seed mixture without approval of the Environmental Scientist (Bureau of Design, Environmental Services Section).

903.3 CONSTRUCTION REQUIREMENTS

a. Seeding Seasons. Determine the seeding season using **TABLE 903-1.**

TABLE 903-1: GRASS & WILDFLOWER SEEDING SEASONS

Type	Season
Cool Season Grasses	February 15 thru April 20 August 15 thru September 30
Warm Season Grasses and Wildflowers	November 15 thru June 1

If cool season grasses are mixed with warm season grasses, seed during the warm season seeding season. When the area to be seeded is less than 1 acre (bid item "Seeding" per lump sum), the area shall be seeded during the seeding seasons specified for either cool season grasses or warm season grasses. Plant temporary seeding any time of the year.

The Engineer may extend the seeding season a few days in special situations when only a few acres of seeding would complete the entire project.

Seed the project during the proper seeding season to protect the finished grading. This may require seeding different parts of the project at different times or seasons. Complete the area once the seeding operations begin in an area.

b. Preparation of the Seedbed. Unless shown otherwise in the Contract Documents, prepare the seedbed and seed all disturbed or cultivated areas within the right-of-way and construction easements.

The Grading Contractor shall repair eroded areas before the seedbed is prepared.

In urban areas, use a landscape box to level the seedbed. Grade seedbeds to the elevations of abutting sidewalks. Remove rocks and other debris detrimental to mowing with lawn maintenance equipment.

Before seeding, use tillage implements that shall penetrate 2 to 3 inches to prepare a firm, friable and weed-free seedbed. If the use of disks and harrows is impracticable, prepare the seedbed using hand methods.

Prepare seedbeds in developed urban and residential areas using rotary tillers or similar equipment. Tractor mounted equipment is permitted if the area is large enough to facilitate the use of such equipment.

Do not injure trees while preparing the seedbed. If the Engineer designates areas of desirable perennial native grasses to remain, do not till such areas. If areas of annual grasses such as cheat, crabgrass or triple-awn are encountered, destroy such grasses by thorough disking.

Do not till areas if temporary or existing grasses provide stable slopes with no erosion. Seed the permanent grasses into the existing cover using a no-till drill.

c. Seeding. In rural areas, use seed drills that comply with **subsection 156.1.** If it is impracticable to operate a seed drill, broadcast the seed with a standard manufacture grass seeder. A hydro-seeder may be used in place of the broadcast seeder when approved by the Engineer.

On lawn areas and small areas in developed urban areas, apply the seed with equipment suitable for the size of the area. Use manually operated drop-seeders, cyclone spreaders or other similar equipment when appropriate. After the seeding, but before mulching, hand rake the seeded lawn areas.

Similar size seeds may be mixed before drilling. The seed company may mix the seeds before delivery, or the Contractor may mix the seeds at the project site. If the seed company mixes the seeds, each bag of mixed seeds shall have a tag indicating the quantity (pounds) of each type seed and the total weight (pounds) of the bag. If the Contractor mixes the seeds, the Engineer must witness the mixing.

If required, inoculate the seeds according **DIVISION 2100.**

The drill used for seeding shall accommodate the seed sizes and weight of seed by the use of as many compartments as required. Seeds of compatible size and weight may be mixed and placed in the same compartment. Drill seed at the rate and in the locations shown in the Contract Documents. Drills shall comply with **subsection 156.1.**

Drill the seeds into the prepared seedbed. The maximum depth for drilling grass seeds is ½ inch. Unless shown otherwise in the Contract Documents, the maximum depth for drilling wildflower seeds is ⅛ inch. If grasses and wildflowers are seeded on the same area, drill the grasses first, then the wildflowers.

After an area is fertilized and seeded, firm the soil using a cultipacker or smooth roller.

d. Hydro-seeding. On steep slopes or other areas inaccessible with a seed drill or broadcast seeder, a hydro seeder may be used when approved by the Engineer. Apply the seed-fertilizer-water slurry within 1 hour after the seed is added to the hydro-seeder tank. Apply seed evenly over the entire site. Use a fan-type nozzle with approximately 500 gallons of water per acre. Add 75 pounds of hydro-mulch per 500 gallons of water for a visual tracer. After the seeding, but before mulching, hand rake the seeded areas inaccessible by a cultipacker. Immediately apply bonded fiber matrix according to **subsection 904.3c.** Do not apply hydro-seed and bonded fiber matrix in one application.

e. Seeding/Lump Sum. This item is only used on projects with less than 1 acre of seeding.

Prepare the seedbed, fertilize, seed and mulch all disturbed or cultivated areas within the right-of-way and construction easements according to **DIVISION 900.**

903.4 MEASUREMENT AND PAYMENT

The Engineer will measure the total quantity for each type of pure live seed and soil erosion mix used by the pound.

The Engineer will measure "Seeding" by the lump sum. No measurement will be made of the area seeded.

Payment for the various types of "Seed", "Seed (Hydro)" and "Seeding" at the contract unit prices is full compensation for the specified work.

SECTION 901

TEMPORARY EROSION AND POLLUTION CONTROL

901.1 DESCRIPTION

Install, maintain and remove temporary erosion and pollution control devices as required during the construction of the project.

BID ITEMS	UNITS
Temporary Berm	Linear Foot
Temporary Slope Drain	Linear Foot
Temporary Slope Barrier (Set Price)	Linear Foot
Temporary Ditch Check	Linear Foot
Temporary Ditch Check (Rock) (Set Price)	Cubic Yard
Temporary Inlet Sediment Barrier	Each
Temporary Sediment Basin	Cubic Yard
Temporary Stream Crossing	Each
Sediment Removal (Set Price)	Cubic Yard
Temporary Fertilizer (**)	Pound
Temporary Seed (****)	Pound
Soil Erosion Mix	Pound
Temporary Seeding	Lump Sum
Erosion Control (*)	Square Yard
Mulching (Temporary)	Acre
Mobilization (Emergency Erosion Control) (Set Price)	Each

* Class & Type
** Type of Fertilizer
*** Type

901.2 MATERIALS

a. Provide sediment barriers, fertilizers, seeds, soil erosion mix, erosion control materials and mulch that comply with **DIVISION 2100.**

Provide aggregate that complies with aggregate ditch lining, D_{50} = 6 inches, **DIVISION 1100.** Existing aggregate from the project may be used under this specification, provided all applicable physical requirements are met.

b. Straw or Hay Bales. Provide straw or hay bales that are free of weeds declared noxious by the Kansas Department of Agriculture. Provide bales bound with twine. Do not use bales bound with wire.

The Engineer will accept the straw or hay bales based on **DIVISION 2100.**

c. Temporary Slope Drain. Provide metal pipe, plastic pipe or flexible rubber pipe for temporary slope drains.

The Engineer will accept the material for temporary slope drain based on the condition of the pipe and visual inspection of the installed drain.

d. Biodegradable Logs. Provide commercially available biodegradable logs manufactured from rice straw, excelsior wood fiber, coconut fiber, jute or other biodegradable material bound with an open mesh fabric of jute or light-weight plastic.

The Engineer will accept the biodegradable logs based on compliance with dimensional and other requirements shown in the Contract Documents, and visual inspection of the installed material.

e. Geo-Ridge Permeable Berm™ or equivalent. The Environmental Scientist (Bureau of Design, Environmental Services Section) will consider an equivalent of the brand name specified. Provide the Engineer with a complete description, literature, test reports, etc. on the proposed equivalent.

The Engineer will accept the Geo-Ridge Permeable Berm™ (or an equivalent approved by the Environmental Scientist) based on brand name and visual inspection of the installed material.

f. Triangular Silt Dike™ or equivalent. The Environmental Scientist (Bureau of Design, Environmental Services Section) will consider an equivalent of the brand name specified. Provide the Engineer with a complete description, literature, test reports, etc. on the proposed equivalent.

The Engineer will accept the Triangular Silt Dike™ (or an equivalent approved by the Environmental Scientist) based on brand name and visual inspection of the installed material.

901.3 CONSTRUCTION REQUIREMENTS

a. Responsibility. Take all measures necessary to prevent erosion and pollution on the project and project related borrow areas.

If the contract does not include temporary erosion and pollution control bid items, and such work is required, items will be added as provided for in **subsection 104.8.**

Use KDOT's Temporary Erosion Control Manual as a guide for the design, installation and maintenance of temporary erosion control measures.

Install erosion control devices according to the approved erosion control schedule prior to or simultaneously with the clearing and grubbing operations. Do not perform grading until erosion control devices are in place as approved by the Engineer. Install devices to establish a perimeter control of the project in areas where it is anticipated that storm water runoff will leave the project.

Update the erosion control schedule as work progresses to show changes due to revisions in work schedules or sequence of construction, or as directed by the Engineer. Update the site map to reflect erosion control devices that have been installed.

As a minimum, perform the following erosion control actions:

- Use temporary erosion and pollution control actions to control erosion resulting from the construction of the project;
- Use temporary erosion and pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds or other areas of water impoundment;
- Coordinate temporary erosion and pollution control measures with the construction of permanent erosion control features to provide continuous erosion control;
- Schedule construction of drainage structures and permanent erosion control features as soon as practical; and
- Initiate temporary erosion and pollution control measures for areas that have been disturbed, within 14 calendar days after construction activities have temporarily or permanently ceased on a portion of the project site. Exceptions are as follows:
    - If implementation of erosion and pollution control measures is precluded by snow cover, undertake such measures as soon as practical.
    - If construction activities will resume on the portion of the project site within 21 calendar days, temporary erosion and pollution control measures do not have to be initiated.
    - In arid regions (average annual rainfall of less than 10 inches), during seasonal arid conditions, implement the erosion and pollution control measures as soon as practical, but not necessarily within 14 calendar days.

Update the erosion control schedule as work progresses to account for changes due to revisions in work schedules or sequence of construction, or as directed by the Engineer. Update the site map to reflect erosion control devices that have been installed.

b. Permits. KDOT (or the local governmental agency) will obtain a National Pollutant Discharge Elimination System (NPDES) permit for projects with 1 acre or more of erodible surface. When Contractor-furnished borrow is required, obtain all required permits and clearances required for compliance, **subsection 107.2.**

A NPDES permit is not required for a project with less than 1 acre of erodible surface. The Contractor is not required to submit an erosion control schedule. The Contractor is required to comply with the concepts for erosion and pollution control presented in KDOT's Storm Water Pollution Prevention Plan (SWPPP), see **subsection 901.3d.**

c. General. Unless approved in writing by the Engineer, do not exceed 750,000 square feet of surface area of erodible earth material per equipment spread at one time. The Engineer will limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations. Limit the exposed erodible earth material according to the capability and progress and in keeping with the approved schedule.

If on-site or state-furnished off-site borrow areas are to be excavated below the ground water elevation, construct a permanent berm around the borrow area to prevent storm water runoff from entering the excavated area.

Restrict construction operations in rivers, streams and other water impoundments to those areas that must be entered for the construction of temporary or permanent structures. When no longer required, promptly remove all falsework, piling, temporary crossings and other obstructions caused by the construction.

Do not ford live streams with construction equipment.

As dictated by weather conditions, actual site conditions and construction procedures, install and maintain temporary erosion and pollution control devices as shown in the Contract Documents, and as directed by the Engineer.

Implement temporary erosion and pollution control with berms, slope drains, ditch checks, slope barriers, sediment basins, inlet sediment barriers, fertilizer, seeding, mulching and erosion control blankets.

If temporary erosion and pollution control is not implemented and maintained according to the approved schedule, all work on the project shall cease until conditions are brought into compliance, as determined by the Engineer.

d. Project Storm Water Pollution Prevention Plan (SWPPP). Include in the project SWPPP, KDOT's SWPPP, Contract Documents pertaining to temporary erosion and water pollution control, inspection and maintenance reports, and the Contractor's erosion control schedule. KDOT's SWPPP can be found on the KDOT Internet at www.ksdot.org.

Before any construction activities begin, the Contractor and subcontractors implementing any measures identified in the SWPPP are required to certify that they understand the terms and conditions of the general NPDES permit. The Engineer will provide the certification form.

Before the preconstruction conference, submit to the Field Engineer 3 copies of a schedule for implementing and maintaining erosion and pollution control work during the construction phases. No contract work may begin until the Field Engineer has approved the erosion control schedule. As a minimum, the following information shall be included in the Contractor's erosion control schedule:

(1) The planned sequence of major construction activities.

(2) A site map showing the locations and devices to be used for the initial perimeter controls.

(3) A description of controls to be used:

- Stabilization practices for all areas disturbed by construction;
- Structural practices for all drainage/discharge locations; and
- Other controls, including:
    - Waste disposal practices which prevent discharge of solid materials into water in the U.S.;
    - Methods of preventing contamination in areas designated for fuel and lubrication storage;
    - Actions to minimize offsite tracking of sediment by construction vehicles;
    - Actions to obtain compliance with state or local waste disposal, sanitary sewer or septic system regulations; and
    - When actions will be implemented, including permanent erosion control items when required in the Contract Documents.

(4) Acknowledgment that State and Local requirements have been included in the schedule.

(5) Provide a Maintenance and Inspection Report. See **subsection 901.3q**.

e. Temporary Berms. Use temporary berms to divert storm runoff to stabilized slopes or temporary slope drains. Construct temporary berms as shown in the Contract Documents. Compact the berms until no further consolidation is observed, using a dozer track, grader wheel or other equipment.

f. Temporary Slope Drains. Use temporary slope drains to carry storm runoff down fill slopes and cut backslopes. Construct the temporary slope drains as shown in the Contract Documents.

g. Temporary Slope Barriers. Use any of the materials listed in the Contract Documents to construct temporary slope barriers.

When temporary biodegradable logs, straw or hay bales are used, remove and dispose of the sediment when deposits reach approximately ½ the height of the log or bale.

When conditions warrant, supplement the temporary silt fence with a support fence. Reduce the post spacing and drive the posts further in the ground in low and soft, swampy areas. Remove and dispose of sediment deposits when the deposit approaches ⅓ the height of the silt fence.

h. Temporary Ditch Checks. The option exists to use any materials listed in the Contract Documents, excluding rock, to construct temporary ditch checks. When deposits reach approximately ½ the height of the temporary ditch check, remove and dispose of the accumulated sediment.

i. Temporary Ditch Checks Rock. Use rock to construct temporary rock ditch checks listed in the Contract Documents. When deposits reach approximately ½ the height of the temporary rock ditch check, remove and dispose of the accumulated sediment.

j. Temporary Inlet Sediment Barrier. Use any of the materials listed in the Contract Documents to construct temporary inlet sediment barriers.

When temporary silt fence is used, reduce post spacing and drive the posts further into the ground in low and soft, swampy areas. Remove and dispose of the sediment when deposits reach approximately ⅓ the height of the silt fence.

When temporary triangular silt dike, straw or hay bales are used, remove and dispose of the sediment when deposits reach approximately ½ the height of the silt dike or bales.

k. Temporary Sediment Basins. Before constructing a temporary sediment basin, clear the area of all vegetation. Construct the temporary sediment basin with a wide cross-section and a minimum grade, as shown in the Contract Documents. Dispose of excess excavated material.

Remove and dispose of the accumulated sediment when deposits reach approximately ⅓ the depth of the structure.

l. Temporary Stream Crossing. Use any of the materials shown in the Contract Documents to construct temporary stream crossings.

When the Contractor's operations require a temporary stream crossing, and one is not shown in the Contract Documents, the Contractor may install one at no cost to KDOT. Comply with all applicable rules and regulations, obtain all required permits and provide copies of all permits to the Field Engineer.

m. Temporary Fertilizer, Seed and Mulch. Prepare the seedbed, fertilize, seed and mulch according to **DIVISION 900.** Apply the temporary fertilizer, seed and mulch at the rates shown in the Contract Documents.

n. Soil Erosion Mix. Prepare a smooth, weed-free and debris-free area, and broadcast or hydro-seed the soil erosion mix seed over the prepared area. Lightly hand rake broadcasted seed before placement of the erosion control.

o. Temporary Seeding. "Temporary Seeding" is to be used only if the project has less than 1 acre of erodible surface. If this item is used, fertilize, seed and mulch all exposed erodible earth.

Prepare the seedbed, fertilize, seed and mulch according to **DIVISION 900.** Apply the temporary fertilizer, seed and mulch at the rates shown in the Contract Documents.

p. Erosion Control. After seeding according to **DIVISION 900,** install erosion control according to the manufacturer's requirements for edge and junction overlaps, staple size and staple pattern.

(1) Areas with Erosion Control (Class I). Place the Erosion Control (Class I). Do not mulch over the Erosion Control (Class I).

(2) Areas with Erosion Control (Class II). Place the Erosion Control (Class II) and cover it with ½ inch of pulverized, fine-grained soil. Hand rake the soil into the erosion control material; then mulch the area according to **SECTION 904.**

q. Maintenance and Removal of Temporary Erosion and Pollution Control Devices. Maintain the effectiveness of the temporary erosion and pollution control devices as long as required to contain sediment runoff. Inspect the temporary erosion and pollution control devices and complete the inspection and maintenance reports every 7 days and within 24 hours of a rainfall event of ½ inch or more. Monitor temporary erosion and pollution control devices at least daily during prolonged rainfall. Within 48 hours, begin corrective action of any deficiencies found in the perimeter controls, and complete corrective actions within 7 calendar days. Correct all other devices as soon as conditions allow access to their location without causing additional damage to the slopes.

Submit copies of inspection and maintenance reports to the Field Engineer within 3 working days after an inspection has been made. Use either KDOT-furnished maintenance report forms or approved Contractor's maintenance forms.

Remove the temporary devices when directed by the Engineer. After removing the temporary erosion and pollution control devices, remove and dispose of the silt accumulation. Grade, fertilize, seed and mulch any bare areas.

When temporary erosion and pollution control devices are installed according to the Contract Documents, or as approved by the Engineer and such devices are no longer effective because of deterioration or functional incapacity, payment will be made for replacement of these devices, as directed by the Engineer. No payment will be made for replacing temporary erosion control devices that become ineffective because of improper installation, lack of maintenance or the Contractor's failure to pursue timely installation of permanent erosion control devices according to the Contract Documents.

r. Mobilization for Emergency Erosion Control and Erosion Control Mobilization Delay Damages.

(1) Mobilize sufficient personnel, equipment, materials and incidentals to the job site within 24 hours after receiving the Engineer's written order to conduct temporary erosion control work on an emergency basis (24-hour period), unless extended by the conditions of **subsection 901.3r.(5)**. Note: "sufficient personnel, equipment, materials and incidentals" is considered to be enough to complete all emergency erosion control within the 7 days from date of notice.

(2) An emergency is a sudden occurrence of a serious nature that causes perimeter erosion control devices to fail (in whole or in part) allowing sediment to be deposited onto adjacent property or streams, or creating a risk that sediment will be deposited onto adjacent property or streams. The work is beyond normal maintenance of erosion control items and requires immediate movement of necessary personnel, equipment, materials and incidentals to the project site. The emergency may require immediate corrective work, installation of erosion control measures or both.

(3) If the Contractor mobilizes to the project within the 24-hour period or an approved extension under **subsection 901.3r.(5)**, the Engineer will pay Mobilization (Emergency Erosion Control) (Set Price).

(4) If the Contractor fails to mobilize to the project within the 24-hour period or approved extension under **subsection 901.3r.(5)**, the Contractor is liable for Erosion Control Mobilization Delay Damages. The Erosion Control Mobilization Delay Damages charged and owing are $500.00 per calendar day for each calendar day (including Sundays, Holidays and the Winter Holiday Period) that the Contractor fails to mobilize to the project after the 24-hour period or approved extension expires. See **subsection 901.3r.(1)**.

(5) The Engineer may extend the mobilization time beyond the 24-hour period for unusually severe weather or Acts of God that prevent the Contractor from mobilizing to the project site.

s. Erosion Control Disincentive Assessment. If the Contractor fails to complete corrective actions of the perimeter controls within the 7 calendar days required under **subsection 901.3q.**, the Contractor is liable for an Erosion Control Disincentive Assessment. The Erosion Control Disincentive Assessment charged and owing is $250.00 for each erosion control device deficiency and for each calendar day (including Sundays, Holidays and the Winter Holiday Period) the deficiency remains uncorrected.

t. Computing Mobilization Delay Damages and Erosion Control Disincentive Assessment. The Engineer will deduct and withhold the Erosion Control Mobilization Delay Damages under **subsection 901.3r.(4)** and Erosion Control Disincentive Assessment under **subsection 901.3s.** to either or both concurrently, as applicable. The assessments are to be computed in the same manner as damages under **subsection 108.8**, (Liquidated Damages) except calendar days include Sundays, Holidays and the Winter Holiday Period.

u. Indemnify KDOT, local government authorities or any other NPDES permit holders from fines that KDHE or EPA impose because of the Contractor's failure to comply with applicable laws, regulations, ordinances and permits.

901.4 MEASUREMENT AND PAYMENT

The Engineer will measure temporary berms, temporary slope drains, temporary slope barriers and temporary ditch checks by the linear foot.

The Engineer will measure temporary rock ditch checks by the cubic yard.

The Engineer will measure each temporary inlet sediment barrier and temporary stream crossing as a unit.

The Engineer will measure temporary sediment basins by the cubic yard excavated to construct the basin.

The Engineer will measure sediment removal by the cubic yard of sediment removed.

The Engineer will measure temporary fertilizer, temporary seed and soil erosion mix by the pound.

The Engineer will measure "Temporary Seeding" as a lump sum; no measurement of area is made.

The Engineer will measure erosion control by the square yard.

The Engineer will measure temporary mulching by the acre.

The Engineer will measure Mobilization, Emergency Erosion Control per each mobilization ordered by the Engineer.

The Engineer will measure any disincentive assessment on an each devise per day basis.

The Engineer will measure any erosion control mobilization delay damages by the lump sum.

Payment for the various items of temporary erosion and pollution control is full compensation for the specified work. Contract unit prices will govern regardless of overruns or underruns of the estimated quantity.

Payment for "Temporary Slope Barrier (Set Price)", "Temporary Ditch Check Rock (Set Price)", "Sediment Removal (Set Price)" and "Mobilization, Emergency Erosion Control (Set Price)"at the contract set unit prices is full compensation for the specified work.

SECTION 2108

FERTILIZERS

2108.1 DESCRIPTION

This specification covers the material requirements for fertilizers.

2108.2 REQUIREMENTS

a. Fertilizers used on KDOT projects must comply with the applicable sections of the "Kansas Commercial Fertilizer Law" as administered by the Kansas State Board of Agriculture.

b. Fertilizer Grade. The grade for each commercial fertilizer will be shown in the Contract Documents. The fertilizer grade shown in the Contract Documents shall be read as follows:

- the first number represents the percentage of nitrogen required (expressed as available N),
- the second number represents the percentage of phosphorous required (expressed as the percent of available P_2O_5),
- the third number represents the percentage of potassium required (expressed as the percent of available K_2O).

A mixed fertilizer such as 12-24-12 would contain 12% N, 24% P_2O_5 and 12% K_2O.

A tolerance of -0.5% will be permitted for each of the designated ingredients in commercial fertilizers.

c. Sources of Fertilizer. Use one of the following types of commercial fertilizers on KDOT work:

(1) Package fertilizers in granulated or tablet form, manufactured by firms registered by the Kansas State Board of Agriculture annually on July 1st.

Fertilizer tablets are commercially prepared, tightly compressed material used when planting trees and plants. They are formulated to be long-lasting (2 year minimum) with a slow-release analysis of 20-10-5 derived from urea-formaldehyde, calcium phosphates, potassium sulfate, calcium sulfate, ferrous sulfate and comply with the following minimum guaranteed analysis.

Total Nitrogen (N)*	20.0%
7% Water Soluble Organic Nitrogen	
13% Water Insoluble Nitrogen	
Available Phosphoric Acid (P_2O_5)	10.0%
Soluble Potash (K_2O)	5.0%
Calcium (Ca)	2.6%
Sulfur (S)	1.6%
Iron (Fe)	0.35%

*17% slowly available nitrogen from urea-formaldehyde

(2) Bulk fertilizers blended by custom blenders licensed by the Kansas State Board of Agriculture annually on January 1st. Liquid fertilizers are considered to be bulk fertilizers.

2108.3 TEST METHODS

None specified.

2108.4 PREQUALIFICATION

Comply with registration and licensing requirements of the Kansas State Board of Agriculture as specified in **subsection 2108.2c.(2).**

2108.5 BASIS OF ACCEPTANCE

a. Package Fertilizers.

(1) Receipt of the current certificate of registration issued by the Kansas State Board of Agriculture for annual registration of the product.

(2) The grade of commercial package fertilizers will be determined and accepted on the basis of the label analysis, which must appear on each package. Show on the label analysis the following information as required by the applicable provisions of the "Kansas Commercial Fertilizer Law":

(a) the name and address of the person registering the commercial fertilizer;

(b) the brand and grade of the commercial fertilizer;

(c) the net mass in the package or container;

(d) the registered guaranteed analysis. The guaranteed analysis includes the minimum percentages of plant foods in the following order and form:

Nitrogen, minimum ___ percent
Available phosphoric acid, minimum___ percent
Soluble potash, minimum___ percent,

except as follows:

- unacidulated mineral phosphatic materials and basic slag show the guaranteed analysis in the following order and form:

  Total phosphoric acid, minimum___ percent
  Available phosphoric acid, minimum___ percent
  Fineness of grind:___ percent through mesh screen, and

- bone, tankage, and other natural organic phosphate materials shall show the guaranteed analysis in the following form:

  Total phosphoric acid, minimum___ percent;

(e) Commercial fertilizers containing any ingredient which is injurious to plants must be labeled to show:

- the name and percentage of each such active ingredient;
- adequate directions for use, and
- adequate warnings against misuse;

(f) the minimum percentage of any and all other plant food elements or compounds contributing to the value of the commercial fertilizer, and

(g) any other information as may be prescribed by rules and regulations.

(3) Small quantities of package fertilizers may be accepted on brand name. Only high quality fertilizer of a recognized brand, and of the proper grade and type for the intended use, will be accepted in this manner.

b. Bulk.

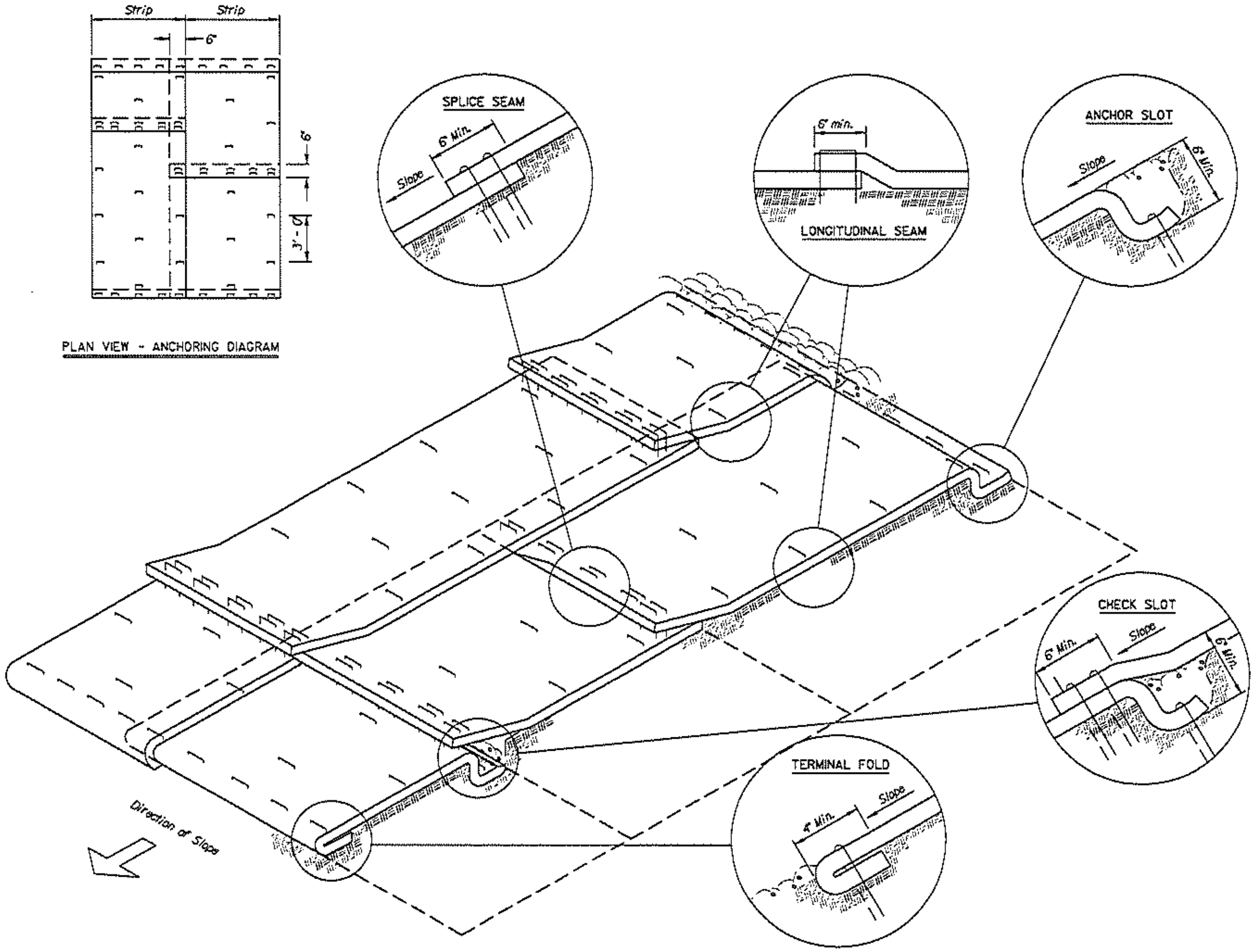
(1) Receipt of a copy of custom blender's current license issued by the Kansas State Board of Agriculture.

(2) Receipt of a certified label or a certified delivery slip covering each shipment, and showing the information required in **subsection 2108.05(a)(2).**

c. Verification Tests. Verification tests may be conducted by KDOT on samples obtained at frequencies and locations designated by the Engineer to determine the reliability of bag label analysis and custom blender certified labels or a certified delivery slip.

If a product of any supplier is found to consistently deviate from the bag level analysis or the custom blenders certified analysis, the acceptance of that product will be discontinued. Copies of the failing test reports will be furnished to the Kansas State Board of Agriculture for appropriate action under the "Kansas Commercial Fertilizer Law".

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



PLAN VIEW - ANCHORING DIAGRAM

ISOMETRIC VIEW

INSTALLATION DETAILS FOR EROSION CONTROL CLASS I

Erosion Control Blankets shall be laid loosely in the direction of the slope, beginning at the bottom of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.

1. *ANCHOR SLOTS: The top of the blanket should be slotted in at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.*
2. *LONGITUDINAL SEAMS: The edges of the blanket should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.*
3. *SPLICE SEAM: When splices are necessary, overlapend a minimum of 6 inches in direction of water flow. Stagger splice seams.*
4. *CHECK SLOTS: Establish check slots transverse toslope every 30 feet. The slots should be 6 inches wide x 6 inches deep. The blanket shall be cut to a length 6 inches beyond the slot. The top of the downslope blanket shall be slotted in, anchored and buried, tamped and seeded similar to the top anchor slot. The upslope blanket shall then cover the slot and be anchored as shown.*
5. *TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.*
6. *TYPICAL ANCHORS: Anchor design shall be as recommended by the manufacturer.*

NOTE:
Agricultural products, such as native prairie hay, used for mulching and erosion control practices, excluding wood based mulch, shall meet the North American Weed Free Forage Standards.

NO.	DATE	REVISIONS	BY	APP'D
	9/20/07	Revised Standard	MRM	SHS
	9/16/05	Revised Standard	MRM	SHS
	9-22-99	Revised Standard	WCL	RDR

KANSAS DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL
EROSION CONTROL CLASS I
SLOPE PROTECTION

LA855

FHWA APPROVAL 9/22/2005	APP'D		Richard D. Rose
DESIGNED MRM	DETAILED MRM	QUANTITIES	CADD MRM
DESIGN CK. SHS	DETAIL CK. SHS	QUAN. CK.	CADD CK. MRM

Std. Base File: la855.dgn
Plotted By: rlang | Plot Location: Bridge Design
File: la855.dgn (la855)
Plot Date: 20-SEP-2010 07:39

SECTION 2103

SEEDS

2103.1 DESCRIPTION

This specification covers the material requirements for seeds.

2103.2 REQUIREMENTS

a. General. Provide seeds which comply with the seed and noxious weed laws of the State of Kansas and applicable Kansas Department of Agriculture Rules and Regulations except as specifically noted in this Section.

Do not provide Sericea Lespedeza and Multiflora Rose with any seed.

b. Seed Quality and Definitions. Conduct all seed analyses in accordance with rules and regulations as prescribed by the Association of Official Seed Analysts (AOSA) and Kansas Seed Law. The Kansas Seed Law specifies the kind and amount of weed seed permitted; the requirement for a current analysis report; and labeling of all seed to show its purity, germination, date of last germination test, and weed seed content.

Cleaning and conditioning of seed must result in a product that meets or exceeds minimum standards. The product must also be clean enough to plant using existing drilling equipment without further processing.

(1) Kansas Seed Law. The germination test is valid for 9 months after the end of the month the test was made, so long as the seed remains in Kansas.

(2) Federal Seed Law. For seed shipped across state lines, the germination test is valid for 5 months after the end of the month the test was made.

(3) Interpretation of Current Analysis Report. For seed purchased during the valid period of the germination test, the analysis report may be considered current for the full seeding period in effect at the time of purchase. (If seed is purchased March 1, and the valid date expires March 31, the analysis report may be considered current if the seed is planted by April 30, which is the end of the spring seeding period. If the seed is to be planted during a later seeding season, a new germination test is required.) This interpretation may be amended by the Engineer for those projects in which KDOT delayed seeding to a later seeding season. In these situations the seed need not be retested only for the next season.

c. Pure Live Seed (PLS) Requirements and Determination. Compute percent pure live seed (%PLS) by adding percent germination to percent firm or hard seed. Divide the sum by 100. Multiply this product by the percent purity.

$$\% \text{ PLS} = \frac{(\% \text{ Germ.} + \% \text{ Firm or Hard Seed}) \times \%\text{Purity}}{100}$$

Minimum PLS requirements are shown in **TABLES 2103-1** and **2103-2.** The Engineer may grant permission to use seeds that fail to comply with the required PLS provided the following conditions are met.

(1) The Contractor can provide suitable evidence to the Engineer that seeds comply with **TABLE 2103-1** or **2103-2** are not readily available.

(2) The Contractor is willing to increase the quantity of seeds, at no additional cost to KDOT, to provide the minimum quantity of PLS required.

d. Origin of Seed. Where named or numbered strains are not available, use of seed from native stands is permitted if the seed is harvested within range of its planting location not to exceed:

(1) 300 miles south, 150 miles north or west and 1500 feet in higher elevation.

(2) Native seed sources must be identified as to state and county where seed was harvested in order to certify location and elevation.

e. Buffalo Grass Seed (Buchloe dactyloides). Buffalo grass seed may be an improved strain, hybrid or named variety as specified on the Contract Documents. Stain with a dye. Treat all buffalo grass seed to enhance germination.

f. Bulk Seed Determination. Determine the amount of bulk seed needed for each bid item based on PLS requirements and the following formula:

$$\text{Total Bulk Mass} = \frac{\text{Bid Item PLS Plan Quantity}}{\%\ \text{PLS}}$$

2103.3 TEST METHODS

As prescribed by the AOSA and The Kansas Seed Law.

2103.4 PREQUALIFICATION

None Required. Seed supplier must follow all registration and licensing requirements stated in The Kansas Seed Law.

2103.5 BASIS OF ACCEPTANCE

The Engineer will accept each seed shipment to a project work site based on the following:

a. Receipt of a copy of the seed supplier's "Kansas Seed Law Business Registration" certificate.

b. Receipt and approval of a certification from the seed supplier stating the compliance of the supplied seed with this specification and The Kansas Seed Law.

c. Verification that each seed container is labeled as required by The Kansas Seed Law.

d. Verification of compliance with the minimum required % PLS as stated in **TABLE 2103-1** and **2103-2.**

TABLE 2103-1: GRASS SEED

Bid Item	Minimum % PLS
Bluegrass, Kentucky	64.0
Bluestem, Big (Kaw)	35.0
Bluestem, Little (Aldous)	28.0
Bluestem, Sand (Garden)	35.0
Bromegrass, Smooth	72.0
Buffalograss (Sharp's Improved)	72.0
Canarygrass,(Reed)	63.0
Dropseed, Sand	57.0
Fescue, Tall, (K-31), (Rebel II)	80.0
Foxtail, Creeping (Garrison)	60.0
Grama, Blue (Lovington)	21.0
Grama, Sideoats (El Reno)	35.0
Indiangrass (Osage)	42.0
Lovegrass, Sand (Bend)	58.0
Millet, Foxtail	77.0
Ryegrass, Perennial	83.0
Sacaton, Alkali (Salado)	57.0
Sandreed, Big	15.0
Sandreed, Prairie	28.0

TABLE 2103-1: GRASS SEED	
Bid Item	**Minimum % PLS**
Sudangrass	76.0
Switchgrass (Blackwell)(Kanlow)	81.0
Timothy	76.0
Wheatgrass, Intermediate	72.0
Wheatgrass, Streambank (Sodar)	63.0
Wheatgrass, Western (Barton)	60.0
Wheat x Wheatgrass Hybrid (Regreen)(TM)	85.0
Wild-rye, Canada	**
Ryegrass, Common	83.0
Ryegrass, Italian	83.0

** No Industry Standard

TABLE 2103-2: WILDFLOWER SEED		
Common Name	**Bid Item**	**Minimum % PLS**
Golden yarrow	Achillea filipendulina	**
Yarrow	Achillea millefolium	68.0
Red yarrow	Achillea millefolium f. rubra	**
Lead-plant	Amorpha canescens*	**
False-indigo	Amorpha fruticosa*	**
Swamp milkweed	Asclepias incarnata	**
Common milkweed	Asclepias syriaca	**
Butterfly milkweed	Asclepias tuberosa	**
Drummond's aster	Aster drummondii	**
Fendler's aster	Aster fendleri	**
New England aster	Aster novae-angliae	**
Aromatic aster	Aster oblongifolius	**
Azure aster	Aster oolentangiensis	**
Single-stemmed bog aster	Aster paludosus subsp. hemisphericus	**
	Aster patens var. patentissimus	**
Willowleaf aster	Aster praealtus var. praealtus	**
Silky aster	Aster sericeus	**
Blue false-indigo	Baptisia australis var. minor*	**
Plains wild-indigo	Baptisia bracteata var. glabrescens	**
Purple poppy-mallow	Callirhoe involucrata	**
Showy partridge-pea	Cassia chamaecrista*	**
Indian paintbrush	Castilleja coccinea	**
Citron paintbrush	Castilleja purpurea var. citrina	**
Downy paintbrush	Castilleja sessiliflora	**
Cornflower	Centaurea cyanus	80.0
Ox-eye daisy	Chrysanthemum leucanthemum	78.0
Chicory	Cichorium intybus	83.0
Bigflower coreopsis	Coreopsis grandiflora	**
Lance-leaved coreopsis	Coreopsis lanceolata	71.0
Plains coreopsis	Coreopsis tinctoria	83.0
Rough-leaf dogwood	Cornus drummondii	**
Gray dogwood	Cornus foemina	**
Crownvetch	Coronilla varia*	**
Cosmos	Cosmos bipinnatus	76.0
Golden prairie-clover	Dalea aurea*	**
White prairie-clover	Dalea candida*	**

TABLE 2103-2: WILDFLOWER SEED		
Common Name	**Bid Item**	**Minimum % PLS**
Nine-anther prairie-clover	Dalea enneandra*	**
Round-head prairie-clover	Dalea multiflora*	**
Kaneb purple prairie-clover	Dalea purpurea 'Kaneb'*	58.0
Silky prairie-clover	Dalea villosa*	**
Illinois bundleflower	Desmanthus illinoensis*	**
Shooting star	Dodecatheon meadia	**
Purple coneflower	Echinacea angustifolia	**
Pale coneflower	Echinacea pallida	**
Englemann's daisy	Engelmannia pinnatifida	**
Button snakeroot	Eryngium yuccifolium	**
Tall joe-pye weed	Eupatorium altissimum	**
Joe-pye weed	Eupatorium maculatum var. bruneri	**
Boneset	Eupatorium perfoliatum	**
Sweet joe-pye weed	Eupatorium purpureum	**
Indian blanket flower	Gaillardia pulchella	63.0
Prairie gentian	Gentiana puberulenta	**
Snakeweed	Gutierrezia sarothrae	**
Maximilian sunflower	Helianthus maximilianii	**
Dame's rocket	Hesperis matronalis	83.0
Bush morning-glory	Ipomoea leptophylla	**
Perennial Sweetpea	Lathyrus latifolius*	**
Round-head lespedeza	Lespedeza capitata*	**
Rough gayfeather	Liatris aspera	**
Dotted gayfeather	Liatris punctata	**
Eureka thickspike gayfeather	Liatris pycnostachya 'Eureka'	**
Cardinal flower	Lobelia cardinalis	**
Indian-tobacco	Lobelia inflata	**
Blue cardinal flower	Lobelia siphilitica	**
Palespike lobelia	Lobelia spicata	**
Bird's foot trefoil	Lotus corniculatus*	80.0
Tahoka daisy	Machaeranthera tanacetifolia	**
Black-foot daisy	Melampodium leucanthum	**
Wild bergamot	Monarda fistulosa var. fistulosa	**
Missouri eveningprimrose	Oenothera macrocarpa	73.0
White eveningprimrose	Oenothera speciosa	58.0
White beardtongue	Penstemon albidus	**
Buckley's penstemon	Penstemon buckleyi	**
Cobaea penstemon	Penstemon cobaea	**
Large beardtongue	Penstemon grandiflorus	**
Tube penstemon	Penstemon tubaeflorus	**
Blue phlox	Phlox divaricata subsp. laphamii	**
Prairie phlox	Phlox pilosa subsp. fulgida	**
Prairie phlox	Phlox pilosa subsp. pilosa	**
White milkwort	Polygala alba	**
Blood polygala	Polygala sanguinea	**
Sand cherry	Prunus pumila var. besseyi	**
Upright prairieconeflower	Ratibida columnifera	76.0
Mexican hat prairieconeflower	Ratibida columnifera f. pulcherrima	76.0
Grayhead prairieconeflower	Ratibida pinnata	76.0
Sunglow prairieconeflower	Ratibida pinnata 'Sunglow'	**

TABLE 2103-2: WILDFLOWER SEED		
Common Name	**Bid Item**	**Minimum % PLS**
Black-eyed susan	Rudbeckia hirta	78.0
Brown-eyed susan	Rudbeckia triloba var. triloba	**
Nekan blue sage	Salvia azurea 'Nekan'	**
Lance-leaved sage	Salvia reflexa	**
Catclaw sensitive brier	Schrankia nuttallii	**
Compass plant	Silphium laciniatum	**
Cup plant	Silphium perfoliatum	**
Prairie goldenrod	Solidago missouriensis var. fasciculata	**
Rigid goldenrod	Solidago rigida var. rigida	**
Red false-mallow	Sphaeralcea coccinea	**
Prince's plume	Stanleya pinnata var. pinnata	**
Rockpink flameflower	Talinum calycinum	**
Prairie flameflower	Talinum parviflorum	**
Bracted spiderwort	Tradescantia bracteata	**
Prairie spiderwort	Tradescantia occidentalis	**
Ohio spiderwort	Tradescantia ohiensis	**
Shortstem spiderwort	Tradescantia tharpii	**
White clover	Trifolium repens*	**
Venus'looking glass	Triodanis perfoliata	**
Moth mullein	Verbascum blattaria	**
Dakota vervain	Verbena bipinnatifida	**
Rose vervain	Verbena canadensis	**
Hoary vervain	Verbena stricta	**
Arkansas ironweed	Vernonia arkansana	**
Western ironweed	Vernonia baldwinii subsp. interior	**
Western ironweed	Vernonia fasciculata subsp. fasciculate	**
Rocky Mountain zinnia	Zinnia grandiflora	**

*Inoculate legume seeds with their specific nitrogen fixing bacteria listed in **TABLE 2103-3** and in accordance with **SECTION 2106.**

** No Industry Standard

TABLE 2103-3: NITROGEN FIXING BACTERIA			
Genus	**Inoculant**	**Genus**	**Inoculant**
Amorpha	Amorpha Spec 1	Desmanthus	Desmanthus Spec 1
Baptisia	Baptisia Spec 1	Lathyrus	Type C
Cassia	Type EL	Lespedeza	Type EL
Dalea	UMR6815		

Kansas
Department of Transportation
Bureau of Materials & Research

LIST OF PREQUALIFIED EROSION CONTROL PRODUCTS (07-09002-R*)

PQL – 34B **REVISED – 03/01/13**

CMS MATERIAL CODE GROUP (187)

The Contractor has the option of utilizing the following approved products in accordance with the Class and Type as specified on the plans.
Direct all questions to the KDOT Bureau of Design, Environmental Services Section, Eisenhower State Office Bldg, 700 SW Harrison, Topeka, KS 66603. Phone (785) 296-0853.

CLASS 1 "SLOPE PROTECTION"
Type A – Slopes 1:3 or Flatter – Clay Soils:

AEC Premier Straw
AEC Premier Straw Double Net
AEC Premier Straw/Coconut
AEC Premier Coconut
Airtrol - ***Hydromulch***
American Excelsior Bindex
BFM - ***Hydromulch***
Anti-Wash/Geojute
BioD-Mesh 60
BioMac S1
BioMac S2
BioMac SC
Carthage Mills Veg Net
C-Jute
CocoFlex ET-FGM -***Hydromulch***
Contech Standard
Contech Standard Plus
Contech Straw/Coconut Fiber Mat w/Kraft Net
Contech C-35
Curlex™ I
Curlex™ II
Curlex™ 1 CL
Curlex™-LT
Earth Bound - ***Hydromulch***
EarthGuard Fiber Matrix - ***Hydromulch***
EcoAegis™ - ***Hydromulch***
Econo-Jute
EcoFlex HP FGM - ***Hydromulch***
ECB EX 31
ECB EX 32
ECS-2
ECS Excelsior Blanket Standard
ECB S31 Single Net Straw
ECB S32 Double Net Straw
ECS-1
EnviroGuard Plus - ***Hydromulch***
Enviro-Matrix - ***Hydromulch***
Enviro-Shield - ***Hydromulch***
Excel CC-4
Excel CS-3 All Natural
Excel PP5-10
Excel R-1
Excel R-2
Excel Rc-1
Excel S-1
Excel SR-1
Excel SR-1 All Natural
Excel SS-2
Excel Tackmat
Flexterra FGM - ***Hydromulch***
Flexterra Ultra - ***Hydromulch***
Futerra® - ***Hydromulch***
Grass Mat
Greenfix CFS072R
Greenfix WS05
Greenfix WSO72
Green Solutions DNS2
Green Solutions DSC2
Green Solutions SNS1
Greenstreak Pec-Mat
Hy-C3 - ***Hydromulch***
HY-C4 - ***Hydromulch***
Hydra CM - ***Hydromulch***
Hydra CX2 – ***Hydromulch***
Hydro Blanket - ***Hydromulch***
HydroStraw BFM - ***Hydromulch***
Landlok® S1
Landlok® S2
Landlok® CS2
Landlok® 407
Landlok® TRM 435
Landlok® SuperGro
Miramat TM8
Multimat 100
North American Green® S75
North American Green® S75 BN
North American Green® S150
North American Green® S150 BN
North American Green® SC150
Pennzsuppress® - ***Hydromulch***
Poplar Erosion Blanket
ProMatrix EFM - ***Hydromulch***
Rhino Erosion King Single Net
Rhino Erosion King Double Net
Safe Slope Extreme
S1000 Single Net Straw
S2000 Double Net Straw
SEC-S2
Soil Guard - ***Hydromulch***
Soil Saver
SprayMat - ***Hydromulch***
Tackmat S
Terra-Control® - ***Hydromulch***
TerraJute
Terra-Mulch - ***Hydromulch***
Verdyol Ero-Mat
Webtec Terraguard 44P
WintersChoice
WintersCoir
WinterStraw HV
WinterStraw SN

CLASS 1 "SLOPE PROTECTION"
Type B – 1:3 or Flatter – Sandy Soils:

EC Premier Straw
AEC Premier Straw Double Net
AEC Premier Straw/Coconut
AEC Premier Coconut
American Excelsior Bindex BFM - ***Hydromulch***
BioMac S1
BioMac S2
BioMac SC
C-Jute
Carthage Mills Veg Net
CocoFlex ET-FGM - ***Hydromulch***
Contech Standard
Contech Standard Plus
Contech Straw/Coconut Fiber Mat w/Kraft Net
Contech C-35
Conweb Fiber 2000 - ***Hydromulch***
Curlex™ 1
Curlex™ 1 CL
Curlex™ II - CL
Curlex™ LT
Curlex NetFree
Earth Bound - ***Hydromulch***
EarthGuard Fiber Matrix – ***Hydromulch***
EarthGuard Fiber Matrix w/ Vertex - ***Hydromulch***
ECB EX 31
ECB EX 32
ECB S31 Single Net Straw
ECB S32 Double Net Straw
ECS-1
ECS-2
ECS Excelsior Blanket Standard
EnviroGuard Plus - ***Hydromulch***
Excel CC-4
Excel CS-3 All Natural
Excel CS-3
Excel Lc-1
Excel PP5-8
Excel PP5-10
Excel PP5-12
Excel R-1
Excel R-2
Excel Rc-1
Excel SR-1 All Natural
Excel S-1
Excel SS-2
Excel Tackmat
Flexterra FGM - ***Hydromulch***
Flexterra Ultra - ***Hydromulch***
Futerra® - ***Hydromulch***
Geojute Plus 1
Greenfix CFS072R
Greenfix WS05
Greenfix WSO72
Green Solutions DSC2
Green Solutions SNS1
Green Triangle Regular
Green Triangle Superior
Hy-C3 - ***Hydromulch***
Hy-C4 - ***Hydromulch***
Hydra CM - ***Hydromulch***
Hydra CX2 - ***Hydromulch***
Landlok® S1
Landlok® S2
Landlok® CS2
Landlok® 407
Landlok® TRM 435
Landmark Earth Solution Safe Slope Extreme
Miramat 1000
Miramat TM8
Multimat 100
North American Green® S75
North American Green® S75 BN
North American Green® S150
North American Green® SC150
North American Green® S150 BN
Poplar Erosion Blanket
ProMatrix EFM - ***Hydromulch***
Rhino Erosion King Single Net
Safe Slope Extreme
S1000 Single Net Straw
S2000 Double Net Straw
SEC-S2
Soil Guard - ***Hydromulch***
Tackmat S
Terra-Control® – ***Hydromulch***
TerraJute
Verdyol Ero-Mat
Webtec Terraguard 44P
WintersChoice
WintersCoir
WinterStraw HV
WinterStraw SN

CLASS 1 "SLOPE PROTECTION"
Type C – Slopes Steeper than 1:3 – Clay Soils:

AEC Premier Straw Double Net
AEC Premier Straw/Coconut
AEC Premier Coconut
Airtrol - ***Hydromulch***
American Excelsior Bindex BFM - ***Hydromulch***
Anti-Wash/Geojute
BioMac S1
BioMac S2
BioMac SC
Carthage Mills Veg Net
C-Jute
CocoFlex ET-FGM - ***Hydromulch***
Contech Standard Plus
Contech Straw/Coconut Fiber Mat w/Kraft Net
Contech C-35
Curlex™ I
Curlex I CL
Earth Bound - ***Hydromulch***
EarthGuard Fiber Matrix - ***Hydromulch***
Eco-Aegis - ***Hydromulch***
Econo Jute
ECB EX 31
ECB S32 Double Net Straw
EcoFlex HP FGM - ***Hydromulch***
ECS-1
ECS-2
EnviroGuard Plus - ***Hydromulch***
Enviro-Matrix
Enviro-Shield
Excel CC-4
Excel CS-3 All Natural
Excel PP5-10
Excel R-1
Excel-2
ExcelRc-1
Excel S-1
Excel SS-2
Excel SR-1
Excel SR-1 All Natural
Excel Tackmat
Flexterra FGM - ***Hydromulch***
Futerra® - ***Hydromulch***
Greenfix CFS072R
Greenfix WS05
Greenfix WSO72
Greenstreak Pec-Mat
Green Solutions DNS2
Green Solutions DSC2
Green Triangle Superior
Hy-C3 - ***Hydromulch***
Hy-C4 - ***Hydromulch***
Hydra CM - ***Hydromulch***
Hydra CX2 - ***Hydromulch***
Hydro Blanket - ***Hydromulch***
Landlok® S2
Landlok® CS2
Landlok® 407
Landlok® SuperGro
Landlok® TRM 435
Landmark Earth Solution Safe Slope Extreme
Miramat TM8
Multimat 100
North American Green® S75
North American Green® S150
North American Green® S150 BN
North American Green® SC150
Pennzsuppress® - ***Hydromulch***
Poplar Erosion Blanket
ProMatrix EFM - ***Hydromulch***
Rhino Erosion King Single Net
Rhino Erosion King Double Net
Safe Slope Extreme
S2000 Double Net Straw
SEC-S2
SprayMat - ***Hydromulch***
SprayMatt®
Soil Guard - ***Hydromulch***
Soil Saver
Tackmat S
TerraJute
Verdyol Ero-Mat
Verdyol Excelsior High Velocity
Webtec Terraguard 44P
WintersChoice
WintersCoir
WinterStraw HV

CLASS 1 "SLOPE PROTECTION"
Type D – Slopes Steeper than 1:3 – Sandy Soils:

AEC Premier Straw Double Net
AEC Premier Straw/Coconut
AEC Premier Coconut
American Excelsior Bindex BFM - ***Hydromulch***
BioMac S1
BioMac S2
C-Jute
Carthage Mills Veg Net
CocoFlex ET-FGM - ***Hydromulch***
Contech Standard Plus
Contech Straw/Coconut Fiber Mat w/Kraft Net
Contech C-35
Curlex™ I
Curlex™ II
Curlex™ I CL
Curlex™ II CL
Curlex™ Netfree
EarthGuard Fiber Matrix – ***Hydromulch***
EarthGuard Fiber Matrix w/ Vertex - ***Hydromulch***
ECB EX 31
ECB S32 Double Net Straw
EcoFlex HP FGM - ***Hydromulch***
ECS-1
ECS-2
EnviroGuard Plus - ***Hydromulch***
Excel CC-4
Excel CS-3 All Natural
Excel CS-3
Excel PP5-10
Excel PP5-12
Excel R-1
Excel R-2
Excel Rc-1
Excel SR-1 All Natural
Excel S-1
Excel SS-2
Excel Tackmat
Flexterra FGM - ***Hydromulch***
Flexterra Ultra - ***Hydromulch***
Futerra® - ***Hydromulch***
Geojute Plus 1
Greenfix CFS072R
Greenfix WS05
Greenfix WSO72
Green Solutions DSC2
Green Solutions SNS1
Green Triangle Superior
Hy-C3 - ***Hydromulch***
Hy-C4 - ***Hydromulch***
Hydra CM - ***Hydromulch***
HydraCX2 - ***Hydromulch***
Landlok® S2
Landlok® CS2
Landlok® 407
Landlok® TRM 435
Landmark Earth Solution Safe Slope Extreme
Miramat 1000
Miramat TM8
North American Green® S150
North American Green® SC150
North American Green® S150 BN
ProMatrix EFM - ***Hydromulch***
Rhino Erosion King Single Net
Safe Slope Extreme
S2000 Double Net Straw
SEC-S2
Soil Guard - ***Hydromulch***
Tackmat S
TerraJute
Verdyol Ero-Mat
Webtec Terraguard 44P
WintersChoice
WintersCoir
WinterStraw HV

APPROVED PRODUCT LIST
ITEM 169 "SOIL RETENTION BLANKET"

CLASS 2 - "FLEXIBLE CHANNEL LINER"
Type E - Shear Stress Range 0 - 96 Pascal (Up to 2 Pounds Per Square Foot):

AEC Premier Straw/Coconut
BioMac C
BioMac N20
Channel Soxx
Contech Coconut/Poly Fiber Mat
Contech Coconut Mat w/Kraft Net
Contech TRM C-35
Contech TRM C-45
Contech TRM C-50
Curlex® II Stitched
Curlex® III Stitched
Curlex® Enforcer I
Curlex® Enforcer
Earth-Lock
Earth-Lock II
East Coast Erosion Blankets T-RECS
ECB EX 32
ECB P 42 TRM
ECB SC 32 Double Net Extended Term
ECP-2
ECS High Impact Excelsior
ECS Standard Excelsior
Enkamat 7018
Enkamat 7020
Enviromat

Excel CC-4
Excel CS-3
Excel CS-3 All Natural
Excel PP5-8
Excel PP-5-10
Excel PP5-12
Excel S-2
Excel SD-3

Greenfix CFG 2000
Greenstreak Pec-Mat
Koirmat™ 700
Landlok CS2
Landlok C2
Landlok® TRM 435
Landlok® TRM 450
Landlok® TRM 1051
Miramat TM8
Multimat 100
North American Green® C125BN
North American Green® C350
North American Green® SC150BN
North American Green® P550
Pyramat®
Recyclex TRM
Recyclex TRM-V
SEC P2
SEC XL2
StayTurf® ~ *A fully vegetative product that requires an establishment period*

Webtec Terraguard 44P
Webtec Terraguard 45P

CLASS 2 - "FLEXIBLE CHANNEL LINER"
Type F - Shear Stress Range 0 - 192 Pascal (Up to 4 Pounds Per Square Foot):

AEC Premier Straw/Coconut
BioMac C
Channel Soxx
Contech C-35
Contech TRM C-45
Contech C 50
Contech Coconut/Poly Fiber Mat
Contech Coconut Mat w/Kraft Net
Curlex® II Stitched
Curlex® III Stitched
Curlex® Enforcer I
Curlex® Enforcer
Greenfix CFG 2000
Greenfix CFO 72RR
Greenstreak Pec-Mat
Koirmat™ 700
Landlok® CS2
Landlok® C2
Landlok®TRM 435
Landlok®TRM 450
Landlok® TRM 1051
Miramat TM8
Multimat 100
North American Green® C125BN

CLASS 2 - "FLEXIBLE CHANNEL LINER"
Type F - Shear Stress Range 0 - 192 Pascal (Up to 4 Pounds Per Square Foot):

Earth-Lock
Earth-Lock II
East Coast Erosion Blankets T-RECS
ECB EX 32
ECB P 42 TRM
ECB SC 32 Double Net Extended Term
ECP-2
ECS High Impact Excelsior
ECS Standard Excelsior
Enkamat 7018
Enviromat
Excel CC-4
Excel PP5-8
Excel PP5-10
Excel PP5-12
Excel S-2
Excel SD-3
North American Green® C350
North American Green® SC150BN
North American Green® SC250
North American Green® P550
Pyramat®
Recyclex TRM
Recyclex TRM-V
SEC P2
StayTurf® ~ *A fully vegetative product that requires an establishment period*
Webtec Terraguard 44P
Webtec Terraguard 45P

CLASS 2 - "FLEXIBLE CHANNEL LINER
Type G - Shear Stress Range 0 - 287 Pascal (Up to 6 Pounds Per Square Foot):

Channel Soxx
Contech C-35
Contech TRM C-45
Contech C 50
Contech Coconut/Poly Fiber Mat
Curlex® Enforcer
Earth-Lock
Earth-Lock II
East Coast Erosion Blankets T-RECS
ECB EX 32
ECB P 42 TRM
ECP-2
Enkamat 7018
Excel PP5-8
Excel PP5-10
Excel PP5-12
Greenfix CFG 2000
Greenstreak Pec-Mat
Koirmat ™ 700
Landlok® TRM 435
Landlok® TRM 450
Landlok® TRM 1051
Landlok®TRM 1060
Multimat 100
North American Green® C350
North American Green® S350
North American Green® P550
Pyramat®
Recyclex TRM
Recyclex TRM-V
SEC P2
StayTurf® ~ *A fully vegetative product that requires an establishment period*
Webtec Terraguard 44P
Webtec Terraguard 45P

CLASS 2 - "FLEXIBLE CHANNEL LINER
Type H - Shear Stress Range 0 - 383 Pascal (Up to 8 Pounds Per Square Foot):

Channel Soxx
Contech C-35
Contech TRM C-45
Contech C 50
Contech Coconut/Poly Fiber Mat
East Coast Erosion Blankets T-RECS
ECB P 42 TRM
ECP-2
Multimat 100
North American Green® C350
North American Green® P350
North American Green® S350
North American Green® P550
Pyramat®
Recyclex TRM
Recyclex TRM-V

CLASS 2 - "FLEXIBLE CHANNEL LINER
Type H - Shear Stress Range 0 - 383 Pascal (Up to 8 Pounds Per Square Foot):

Excel PP5-8
Excel PP5-10
Excel PP5-12
Landlok® TRM 435
Landlok® TRM 450
Landlok® TRM 1051
Channel Soxx
Contech C-35
Contech TRM C-45
Contech C 50
SEC P2
StayTurf® ~ *A fully vegetative product that requires an establishment period*
Webtec Terraguard 44P
Webtec Terraguard 45P

Multimat 100
North American Green® C350
North American Green® P350
North American Green® S350

CLASS 2 - "FLEXIBLE CHANNEL LINER
Type I - Shear Stress Range 0 - 479 Pascal (Up to 10 Pounds Per Square Foot):

Channel Soxx
ECB P 42 TRM
Excel PP5-8
Excel PP5-10
Excel PP5-12
Landlok® TRM 450
North American Green® C350
North American Green® P550
Recyclex TRM
StayTurf® ~ *A fully vegetative product that requires an establishment period*

CLASS 2 - "FLEXIBLE CHANNEL LINER
Type J - Shear Stress Range 0 - 575 Pascal (Up to 12 Pounds Per Square Foot):

Channel Soxx
Excel PP5-12
Landlok® TRM 450
North American Green® P550
Recyclex TRM
StayTurf® ~ *A fully vegetative product that requires an establishment period*

CELLULOSE FIBER MULCHES
Clay or Tight Soils:

Agri-Fiber
American Fiber Mulch
American Fiber Mulch (with Hydro-Stick)
Conwed Hydro Mulch
Envirogold
Enviro-Gro Fiber Mulch
Enviro Mix
Evercycle™ Hydro-Mulch
Excel Aspen Turbo Mulch
Excel Fibermulch II
GeoSkin
HyC 1
Hydro-Lok
HydroStraw
Lay-Low Mulch
Lonestar Hydro-Grass
Landmark Earth Solution Safe Slope
Oasis Fiber Mulch
Pennzsuppress®
Pro Mat
Pro Mat (with RMBplus)
Pro Mat X
Safe Slope
Second Nature Regenerated Wood Fiber Mulch
Second Nature Wood Fiber Blend
Second Nature Recycled Paper Fiber
Second Nature Recycled Straw Tack
Silva Fiber Plus

CELLULOSE FIBER MULCHES
Clay or Tight Soils:

HydroStraw Guar Plus

CELLULOSE FIBER MULCHES
Sandy or Loose Soils:

American Fiber Mulch
American Fiber Mulch (with Hydro-Stick)
American Fiber Mulch with Stick Plus
Conwed Hydro Mulch
ENCAP Pam 12
Enviro-Gro
Enviro-Mix
Evercycle™ Hydro-Mulch
Excel Aspen Turbo Mulch
Excel Fibermulch II
Excel Fibermulch II (with Exact-Tac)
GeoSkin
HyC 1
Hydro-Lok
HydroStraw
HydroStraw Guar Plus
Landmark Earth Solution Safe Slope
Lay-Low Mulch
Lonestar Hydro-Grass
Oasis Fiber Mulch
Pennzsuppress®
Pro Mat
Pro Mat (with RMBplus)
Pro Mat X
Pro Mat XL
Safe Slope
Second Nature Regenerated Wood Fiber Mulch
Second Nature Wood Fiber Blend
Second Nature Recycled Paper Fiber
Second Nature Recycled Straw Tack